

AMENDMENTS TO THE CLAIMS

1. (currently amended) A data processing method for a hybrid ARQ (HARQ) type II/III on a downlink of a wide-band radio communication system, wherein (i) a serving radio network controller (~~hereinafter, referred to as a~~ SRNC), which is directly connected to a mobile station user equipment to allocate wireless resources to the mobile station user equipment and provides services by interlocking with a wireless communication core network in case of a call connection, and (ii) a controlling radio network controller (~~hereinafter, referred to as a~~ CRNC), which controls a sharing channel of a radio network on which the CRNC is located, are located on ~~[[the]]~~ different radio networks ~~network~~, the method comprising the steps of:

a) generating a radio link control (RLC) – protocol data unit (PDU) (RLC-PDU) (~~hereinafter, referred to as a RLC-PDU~~) in an RLC ~~a radio link control (hereinafter, referred to as a RLC)~~ layer of the SRNC and generating a PDU ~~protocol data unit~~ having RLC-PDU information needed for supporting the hybrid ARQ type II/III based on a header of the RLC-PDU (~~hereinafter, referred to as a~~ HARQ-RLC-Control-PDU);

b) transmitting the RLC-PDU and the HARQ-RLC-Control-PDU via a logical channel to a medium access control dedicated entity (~~hereinafter, referred to as a~~ MAC-D) which treats a protocol data unit transmitted from the RLC layer of the SRNC to a MAC layer of the SRNC via a first logical channel ~~treating a general user part of a MAC layer through a logical channel~~;

c) transmitting the RLC-PDU and the HARQ-RLC-Control-PDU from ~~[[of]]~~ the MAC-D of the SRNC to a medium access control common/shared entity (~~hereinafter, referred to as a~~ MAC-C/SH), a common/shared part of a ~~treating common/shared channel part on the~~ MAC layer of the CRNC;

d) transforming the RLC-PDU and the HARQ-RLC-Control-PDU ~~of the MAC-C/SH of the CRNC~~ to a transmission block and transmitting the transmission block ~~[[it]]~~ to a physical layer of a base station through a first transport channel; and

e) processing the transmission block to a radio frame ~~transmission-form~~ in the physical layer of the base station and transmitting the radio frame ~~[[it]]~~ to the mobile ~~the base station~~ through a ~~[[the]]~~ physical channel ~~layer~~.

2. (currently amended) The data processing method as recited in claim 1, wherein the transmission block includes ~~[[is]]~~ a first MAC-PDU and a second MAC-PDU, which include the RLC-PDU and the HARQ-RLC-Control-PDU, respectively.

3. (currently amended) The data processing method as recited in claim 2, wherein in the step e), at the ~~[[a]]~~ physical layer of the base station, the transmission block is transmitted to the mobile station through the ~~[[a]]~~ physical channel by processing the transmission block to a radio frame ~~transmission-form~~, and a transport format indicator 1 (TFI1) and a transport format indicator 2 (TFI2) of the first and the second MAC-PDU, respectively, are added to the radio frame.

4. (currently amended) The data processing method as recited in claim 3, further comprising the step of:

f) storing the RLC-PDU to a buffer, extracting the RLC-PDU stored in the buffer by using the HARQ-RLC-Control-PDU, decoding the extracted RLC-PDU and transmitting the

RLC-PDU to an upper layer, then transmitting a response to the radio network on which the SRNC is located.

5. (currently amended) The data processing method as recited in claim 4, wherein the step f) includes the steps of:

f1) receiving the ~~the~~ [[a]] radio frame, which has ~~having~~ the RLC-PDU and the HARQ-RLC-Control-PDU, ~~transmitted from the radio network~~ through the ~~the~~ [[a]] physical channel, and receiving information required for performing a physical layer operation;

f2) using the TFI2 to extract the second MAC-PDU from the ~~transforming a radio frame, which has the TFI2 and the HARQ-RLC-Control-PDU, to the second MAC-PDU~~ through the demodulation, the deinterleaving and the decoding process, and transmitting the second MAC-PDU ~~[[it]]~~ to a MAC-C/SH of the mobile station through a second transport channel;

f3) in case of performing the step f2), storing the ~~the~~ [[a]] radio frame ~~having the RLC-PDU~~ to the buffer, generating a data identifier for identifying the RLC-PDU stored in the buffer, and transmitting the data identifier and the second MAC-PDU to the MAC-C/SH of the mobile station;

f4) receiving the second MAC-PDU having the HARQ-RLC-Control-PDU, and a data identifier, from the physical layer of the mobile station, transforming the second MAC-PDU to the HARQ-RLC-Control-PDU and transmitting the HARQ-RLC-Control-PDU and the data identifier to a MAC-D of the mobile station;

f5) transmitting the HARQ-RLC-Control-PDU and the data identifier to an ~~the~~ [[the]] RLC layer of the mobile station through a second logical channel;

f6) interpreting the received HARQ-RLC-Control-PDU to extract a sequence number and a version number, and transmitting the sequence number, the version number and the data identifier to a radio resource control (RRC) layer of the mobile station;

f7) transmitting the sequence number, the version number and the data identifier to the physical layer of the mobile station;

f8) using the data identifier to extract the ~~extracting a radio frame from the buffer,~~ which has the RLC PDU stored in the buffer, and the TFI1, by using the data identifier, and ~~[[by]] using the TFI1, the sequence number and the version number, transforming the extracted radio frame to~~ to extract the first MAC-PDU from the radio frame through the modulating, the deinterleaving and the decoding process, and then transmitting the first MAC-PDU ~~radio frame~~ to the MAC-C/SH of the mobile station;

f9) transforming the first MAC-PDU to the RLC-PDU, after interpreting the first MAC-PDU in ~~[[by]]~~ the MAC-C/SH of the mobile station ~~[[UE]]~~, and transmitting the RLC-PDU to the MAC-D of the mobile station;

f10) transmitting the RLC-PDU to an RLC layer of the mobile station, through the second ~~[[a]]~~ logical channel; and

f11) transmitting the RLC-PDU which is received from the RLC layer of the mobile station, after interpreting the RLC-PDU, and transmitting a response to the radio network on which the SRNC is located.

6. (currently amended) The data processing method as recited in claim 5, wherein in the step f6), the RLC layer of the mobile station interprets the received HARQ-RLC-Control-PDU and after extracting a sequence number and a version number, transmits the sequence

number, the version number and the data identifier to the ~~[[an]]~~ RRC layer of the mobile station using a control RLC HARQ indication (CRLC-HARQ-IND) ~~through CRLC-HARQ-IND~~ primitive.

7. (currently amended) The data processing method as recited in claim 5, wherein in the step f7), the ~~[[an]]~~ RRC layer of the mobile station transmits the sequence number, the version number and the data identifier to the physical layer of the mobile station using a control physical HARQ request (CPHY-HARQ-REQ) ~~through a CPHY-HARQ-REQ~~ primitive.

8. (currently amended) The data processing method as recited in claim 1, wherein the step d) includes the steps of:

d1) performing a transmission scheduling for transmitting the received RLC-PDU and the HARQ-RLC-Control-PDU;

d2) allocating the TFI1 and the TFI2 to the RLC-PDU and the HARQ-RLC-Control-PDU, respectively, and changing the RLC-PDU and the HARQ-RLC-Control-PDU to the first MAC-PDU and the second MAC-PDU, respectively; and

d3) transmitting the first and the second MAC-PDU and the allocated ~~allotted~~ TFI1 and ~~[[the]]~~ TFI2 to the physical layer of the base ~~transceiver~~ station (BTS).

9. (currently amended) The data processing method ~~process methods for hybrid ARQ type II/III on a downlink of a wide band radio communication system~~ as recited in claim 8, wherein the step e) includes the steps of:

- e1) transforming the first MAC-PDU and the second MAC-PDU which have the RLC-PDU and the HARQ-RLC-Control-PDU, respectively, to the ~~[[a]]~~ radio frame through the coding, the interleaving and the modulating process, then transmitting the radio frame to the ~~[[a]]~~ mobile station through the physical channel; and
- e2) transmitting the received TFI1 and ~~[[the]]~~ TFI2 to the mobile station through the physical channel ~~[[layer]]~~.

10. (currently amended) The data processing method as recited in claim 1, wherein the RLC layer of the SRNC generates a relation indicator which denotes a relationship between the RLC-PDU and the HARQ-RLC-Control-PDU, and further comprising the step of transmitting the relation indicator, the RLC-PDU and the HARQ-RLC-Control-PDU to the MAC-D of the SRNC ~~with each PDU~~.

11. (currently amended) The data processing method ~~methods for hybrid ARQ type H/III on a downlink of a wide band radio communication system~~ as recited in claim 10, wherein the relation indicator comprises separate relation indicators of equal value ~~is made~~ for each of the RLC-PDU and the HARQ-RLC-Control-PDU ~~which is generated based on a header part, and has the same value for related PDU's~~.

12. (currently amended) The data processing method as recited in claim 11, wherein the MAC-C/SH of the CRNC treats the ~~related~~ RLC-PDU and the HARQ-RLC-Control-PDU~~[[,]]~~ at the same time by using the relation indicator, wherein ~~[[when]]~~ the separate, equal

relation indicators are ~~relation indicator is received from~~ with each PDU through the MAC-D of the SRNC.

13. (currently amended) The data processing method as recited in claim 12, wherein the first logical channel is a dedicated traffic channel (DTCH) ~~logical channel~~ for transmitting the RLC-PDU and the HARQ-RLC-Control-PDU.

14. (currently amended) The data processing method as recited in claim 12, wherein the first logical channel includes the DTCH and a dedicated control channel (DCCH) ~~logical channels~~ for transmitting the RLC-PDU and the HARQ-RLC-Control-PDU, respectively.

15. (currently amended) The data processing method as recited in claim 12, wherein the first transport channel is a downlink shared channel (DSCH) for transmitting the RLC-PDU and the HARQ-RLC-Control-PDU.

16. (currently amended) The data processing method as recited in claim 12, wherein the first physical channel ~~[[is]]~~ includes a physical downlink shared channel (PDSCH) ~~[[PDSCH]]~~ for transmitting the first and the second MAC-PDU and a dedicated physical channel (DPCH) ~~[[DPCH]]~~ for transmitting the TFI1 and the TFI2.

17. (currently amended) The data processing method as recited in claim 12, wherein the radio networks are ~~network is an~~ asynchronous radio networks ~~network~~.

18. (currently amended) A computer readable data recording media having instructions for a data processing method for a hybrid ARQ (HARQ) type II/III on a downlink of a wide-band radio communication system, wherein (i) a serving radio network controller (~~hereinafter, referred to as a~~ SRNC)₁ which is directly connected to a mobile station user equipment to allocate wireless resources to the mobile station user equipment and provides services by interlocking with a wireless communication core network in case of a call connection and (ii) a controlling radio network controller (~~hereinafter, referred to as a~~ CRNC)₂ which controls a sharing channel of a radio network on which the CRNC is located, are located on ~~[[the]]~~ different radio networks ~~network~~, the method comprising the functions of:

a) generating a radio link control (RLC) – protocol data unit (PDU) (RLC-PDU) (~~hereinafter, referred to as a RLC-PDU~~) in an RLC ~~a radio link control (hereinafter, referred to as a RLC)~~ layer of the SRNC and generating a PDU ~~protocol data unit~~ having RLC-PDU information needed for supporting the hybrid ARQ type II/III based on a header of the RLC-PDU (~~hereinafter, referred to as a~~ HARQ-RLC-Control-PDU);

b) transmitting the RLC-PDU and the HARQ-RLC-Control-PDU via a logical channel to a medium access control dedicated entity (~~hereinafter, referred to as a~~ MAC-D) which treats a protocol data unit transmitted from the RLC layer of the SRNC to a MAC layer of the SRNC via a first logical channel ~~treating a general user part of a MAC layer through a logical channel~~;

c) transmitting the RLC-PDU and the HARQ-RLC-Control-PDU from ~~[[of]]~~ the MAC-D of the SRNC to a medium access control common/shared entity (~~hereinafter, referred to as a~~ MAC-C/SH), a common/shared part of a ~~treating common/shared channel part on the~~ MAC layer of the CRNC;

d) transforming the RLC-PDU and the HARQ-RLC-Control-PDU ~~of the MAC-C/SH of the CRNC~~ to a transmission block and transmitting the transmission block ~~[[it]]~~ to a physical layer of a base station through a first transport channel; and

e) processing the transmission block to a radio frame ~~transmission form~~ in the physical layer of the base station and transmitting the radio frame ~~[[it]]~~ to the mobile ~~the base station~~ through a ~~[[the]]~~ physical channel ~~layer~~.

19. (currently amended) The computer readable data recording media as recited in claim 18, further comprising the function of:

f) storing the RLC-PDU to a buffer, extracting the RLC-PDU stored in the buffer by using the HARQ-RLC-Control-PDU, decoding the extracted RLC-PDU and transmitting the RLC-PDU to an upper layer, then transmitting a response to the radio network on which the SRNC is located.

20. (currently amended) The computer readable data recording media as recited in claim 19, wherein the function f) comprises the functions of:

f1) receiving the ~~[[a]]~~ radio frame, which has ~~having~~ the RLC-PDU and the HARQ-RLC-Control-PDU, ~~transmitted from the radio network~~ through the ~~[[a]]~~ physical channel, and receiving information required for performing a physical layer operation;

f2) using the TFI2 to extract the second MAC-PDU from the ~~transforming a radio frame, which has the TFI2 and the HARQ-RLC-Control-PDU, to the second MAC-PDU through the demodulation, the deinterleaving and the decoding process,~~ and transmitting the second

MAC-PDU ~~[[it]]~~ to a MAC-C/SH of the mobile station ~~user equipment (UE)~~ through a second transport channel;

f3) in case of performing the step f2), storing the ~~the~~ ~~[[a]]~~ radio frame ~~having the RLC-PDU to the~~ ~~[[a]]~~ buffer, generating a data identifier for identifying the RLC-PDU stored in the buffer, and transmitting the data identifier and the second MAC-PDU to the MAC-C/SH of the mobile station;

f4) receiving the second MAC-PDU, ~~which has~~ having the HARQ-RLC-Control-PDU, and a data identifier, from the physical layer of the mobile station, transforming the second MAC-PDU to the HARQ-RLC-Control-PDU and transmitting the HARQ-RLC-Control-PDU and the data identifier to a MAC-D of the mobile station;

f5) transmitting the HARQ-RLC-Control-PDU and the data identifier to an ~~[[the]]~~ RLC layer of the mobile station through a second logical channel;

f6) interpreting the received HARQ-RLC-Control-PDU to extract a sequence number and a version number, and transmitting the sequence number, the version number and the data identifier to a radio resource control (RRC) layer of the mobile station;

f7) transmitting the sequence number, the version number and the data identifier to the physical layer of the mobile station;

f8) using the data identifier to extract the ~~extracting a radio frame from the buffer,~~ ~~which has the RLC PDU stored in the buffer, and the TFI1, by using the data identifier,~~ and ~~[[by]]~~ using the TFI1, the sequence number and the version number, ~~transforming the extracted radio frame to~~ to extract the first MAC-PDU from the radio frame through the modulating modulation, the deinterleaving and the decoding process, and then transmitting the first MAC-PDU ~~radio frame~~ to the MAC-C/SH of the mobile station;

f9) transforming the first MAC-PDU to the RLC-PDU, after interpreting the first MAC-PDU in ~~[[by]]~~ the MAC-C/SH of the mobile station, and transmitting the RLC-PDU to the MAC-D of the mobile station;

f10) transmitting the RLC-PDU to an RLC layer of the mobile station, through the second ~~[[a]]~~ logical channel; and

f11) transmitting the RLC-PDU received from the RLC layer of the mobile station, after interpreting the RLC-PDU, and transmitting a ~~[[the]]~~ response to the radio network on which the SRNC is located.